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PRIVATE AND SOCIAL RETURNS TO EDUCATION IN LABOUR SURPLUS ECONOMIES

by

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Economists have worked mainly within the framework of full employment economies in assessing the returns to education. When one turns to the educational problems of less developed countries, he often encounters a situation of surplus labour.

In the sense used by Ranis and Fei,[1] there is surplus labour when removal of a worker leads to no reduction in output; the marginal product of the last worker is zero, and workers are paid their average products. However, a situation of surplus labour also exists when there is general unemployment throughout an economy, as in India, or in large segments of an economy, as in most other underdeveloped economies. Such a situation is the result of institutionally rigid wages set for any number of reasons above the market-clearing rate. Marginal products are positive but unemployment persists.

In surplus-labour cases of the latter type, the policy prescription very often proposed is a massive investment in education. The benefits claimed for education are many. At the upper end, it is argued that more education will eliminate structural imbalances and bottlenecks as the supply of highly-educated manpower is equated to demand; that more education will create an elite local intelligentsia to lead the effort of political and economic nation-building;[2] that the greater the number of opportunities for being educated at the highest levels, the greater the efforts at all lower levels as people aspire to the top. At the lower end it is argued that

> Substantial indirect returns accrue from the role of the primary school in generalising within a nation basic concepts of progressing and rationality, in awakening aspirations, and in aiding the discovery of latent talent. It can also play a major role in economic development by reducing social dualism in society, creating a literate electorate, and in improving consumption patterns,[3]

It is also argued that African Socialism and similar ideologies not only promise education for the masses but rely upon the educational

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1. John C.H. Fei and Gustav Ranis, Development of the Labor Surplus Economy, Homewood, Illinois, Irwin, 1964.

2. See, for example, Clark Kerr, John T. Dunlop, Frederick H. Harbison, and Charles A. Myers, Industrialism and industrial Man, Oxford University Press, 1963.

3. Report of the Meeting of Ministers of Education of Asian Member States Participating in the Karachi Plan, in M.J. Bowman, et.al., ed., Readings in the Economics of Education, Paris, UNESCO, 1968, pp. 148-150.

system to, in the words of President Nyerere of Tanzania, "Encourage the growth of the socialist values we aspire to."[4]

The specific agenda of this paper is as follows. Section 1 reviews the debate over the applicability of cost-benefit analysis to problems of investment in education and concludes that the cost-benefit approach is indeed useful. Section 2 distinguishes private returns from social returns and enumerates the likely benefits and costs, both private and social, from education. Section 3 focuses on full employment economies and cites some of the empirical evidence on the similarities between private and social returns. Section 4 looks at the private returns to education in labour surplus economies, and Section 5 at the social returns. Section 6 contains some concluding remarks.

1. In Defense of a Cost-Benefit Approach to the Economics of Education

In order to assess the returns from social projects, economists and other social scientists have relied on cost-benefit analysis as the major technique for evaluation and decision-making. According to this criterion, the higher the ratio (or difference) between discounted benefits and costs, the more worthwhile the project.

Cost-benefit analysis utilizes one of two alternative approaches: either rate-of-return or present value. The relative merits of the two approaches have been argued in the literature, and it is noted that the approaches may yield different results in comparing the worth of one project relative to another. Hirshleifer's well-known paper on optimal investment decisions makes the following points:

> The main positive conclusion of the paper is that the present-value rule for investment decision is correct in a wide variety of cases (though not universally) ...
> The main negative conclusion is that the internal-rate-of-return rule for the multiperiod case is not generally correct. . .[5]

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4. Julius K. Nyerere, "Education for Self-Reliance," in Ujamaa: Essays on Socialism, Dar es Salaam, Oxford University Press, 1968.

5. J. Hirshleifer, "On the Theory of Optimal Investment Decision," JPE, August, 1958.

The merits and deficiencies of cost-benefit analysis as a criterion for social decision-making have been discussed at length in the literature. The most comprehensive look at the subject is the 1965 survey article by Prest and Turvey.[6] As they describe cost-benefit analysis:

> Cost-benefit analysis is a practical way of assessing the desirability of projects, where it is important to take a long view (in the sense of looking at repercussions in the further, as well as the nearer, future) and a wide view (in the sense of allowing for side-effects of many kinds on many persons, industries, regions, etc.) i.e., it implies the enumeration and evaluation of all the relevant costs and benefits.

The authors then go on togive an exhaustive list of the main questions which must be answered in practical applications of the technique. These questions involve the enumeration and valuation of costs and benefits, choice of interest rate, and relevant constraints. Specific sub-issues under these headings are discussed in detail. While the problems are many and complex, Prest and Turvey conclude that cost-benefit analysis is a very useful technique, although they caution the reader that applications to the public-utility areas of government are apt to be more fruitful than in the social-services areas. A large number of practitioners in the field of the economics of education --- including Becker[7], Hansen[8], Weisbrod[9], and Blaug[10] --- have proceeded to use cost-benefit analysis and calculate rates of return to education, while recognizing the limitations of ther estimates. Others --- Arrow[11], Bowen[12], and Bowman[13] --- are among the firm believers in the social rate of return to education as a criterion for social investment despite practical difficulties.

However, such a view is not unanimously shared. Perhaps the strongest blast at the rate of return to education concept was made by Merrett[14], who, after considering the problems of enumerating costs and

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6. Prest, A.R. and Turvey, R., "Cost-Benefit Analysis: A Survey," Economic Journal, December, 1965.
7. Becker, Gary S., Human Capital, New York, Columbia University Press, 1964.
8. Hansen, W. Lee, "Total and Private Rates of Return to Investment in Schooling," Journal of Political Economy, 1963, pp. 128-141.
9. Weisbrod, Burton A., "Education and Investment in Human Capital," Journal of Political Economy, October, 1962, part 2 (supplement), pp. 106-123.
10. Blaug, M., "The Rate of Return on Investment in Education in Great Britain," The Machester School, 1965, reprinted in Blaug M., ed., Economics of Education I, London, Penguin Books, 1968, pp. 215-259.

(footnotes carried on on page 4)

benefits and estimating rates of return by econometric techniques, concluded quite simply that "research into the rate of return on education should be discontinued." Balogh and Streeten scorn the social rate of return to education as the "coefficient of ignorance." In the context of less developed economies, Jolly[16] and Okigbo[17] submit that a manpower planning approach is much more fruitful than cost-benefit. Vaizey[18] remains an agnostic. None of these writers disagrees with the notion of cost-benefit analysis in principle. However, they all feel that the practical problems are so serious as to render the technique useless in educational research.

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11. Arrow, Kenneth J., "Criteria for Social Investment," in M.J. Bowman, et.al., Readings in the Economics of Education, Paris, UNESCO, 1968, pp. 869-880.

12. Bowen, William G., "Assessing the Economic Contribution of Education," in M. Blaug, ed., Economics of Education 1, London, Penguin Books, 1968, pp. 67-100.

13. C. Arnold Anderson and Mary Jean Bowman, "Theoretical Considerations in Educational Planning," in M. Blaug, ed., Economics of Education 1, London, Penguin Books, 1968, pp. 351-382.

14. Merrett, Stephen, "The Rate of Return to Education, A Critique," Oxford Economic Papers, November, 1966, pp. 289-303.

15. Balogh, T. and Streeten, P.P., "The Coefficient of Ignorance," Bulletin of the Oxford University Institute of Economics and Statistics, May, 1963, pp. 99-107.

16. Jolly, Richard, Planning Education for African Development, Nairobi, East African Publishing House, 1969.

17. Okigbo, P.N.C., "Criteria for Public Expenditure on Education," in Robinson, E.A.G. and Vaizey, J.E., ed., The Economics of Education, Proceedings of a Conference held by the International Economic Association, London, MacMillan and Co. Ltd., 1966, pp. 479-496.

18. Vaizey, J.E., "Criteria for Public Expenditure on Education," in Robinson, E.AG. and Vaizey, J.E., ed., The Economics of Education, Proceedings of a Conference held by the International Economic Association, London, MacMillan and Co. Ltd., 1966, pp. 451-462.

My own view is that the economist's main contribution to social decision-making in the field of education is to approximate, if only crudely, the marginal[19] social and benefits of an educational endeavour.[20] For even if his estimates are substantially off-the-mark, he will at least have raised explicitly the right questions. As I argue below, the marginal social costs and benefits from education depend in large measure on labour market conditions. I am in full agreement with the approach of manpower planners to give supply and demand conditions heavy weight in educational decisions. But I believe a manpower planning approach that blindly plans supply to match demand is very likely to give answers which are wrong in terms of a welfare- or output-maximization criterion. For example, the decision to expand a country's university should depend on marginal social costs and benefits and not on considerations of manpower shortages alone.

The problems of enumerating the marginal social costs and benefits or education are many and difficult. Just to cite a few of the more important ones, wages do not measure the marginal productivity of graduates or the marginal resource costs of inputs to the educational system; the demand for workers of different educational categories shifts in response to expansion on both the economic and educational fronts; both the economic and non-economic benefits from education are very difficult to enumerate, let alone quantify. These problems are challenging, if not downright discouraging, to practitioners of the cost-benefit approach. However, economic research has exhibited an encouraging tendency to improve over time. As researchers are made more aware of the limitations of the initial efforts of their colleagues, as they seek new ways of dealing with conceptual and measurement problems, and as new and better data sets become available, more thorough and precise analysis will hopefully emerge. In the interim, I submit it is better to use imperfect approximations of social rates of return based on incomplete information than not to consider social returns at all.

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19. I use the term "marginal" to refer in general to either large or small changes on the margin.

20. This viewpoint is shared by W.C. Cash. See "A Critique of Manpower Planning in Africa," in M. Blaug, ed., Economics of Education 2, London, Penguin Books, 1969, pp. 98-122.

2. Private Returns vs. Social Returns

The costs incurred and benefits received by society generally do not equal the costs and benefits to the individual, although they may be of the same general magnitude. The social costs of education include the value of the resources used to construct and maintain school facilities and to train teachers, the output foregone by employing highly-educated persons as teachers rather than in some other occupation, the output foregone by having potentially-productive workers in school rather than on the job, and the other social projects which must be foregone in order to provide students with financial aid. In contrast, the private costs to the student (and/or his family) include foregone earnings and out-of-pocket costs of schooling.

A stream of benefits can be considered at one level from the viewpoint of additional income, either national income or personal disposable income. More generally, benefits can be viewed as increments to social welfare or personal utility, one component of which is income. The welfare/utility approach is conceptually more appealing, although it may operationally be little value.

Social welfare is presumed to depend positively on output (net of education costs) the fraction of the labour force employed, the fraction of the labour force educated beyond a certain level, and equality of opportunity and income distribution. Personal utility is presumed to depend positively on the present value of net lifetime disposable income and the quality, status, and other non-pecuniary aspects of the job which a person holds.[21] The net marginal social benefit from education is the increment to social welfare if one more person is educated; the gross benefit would disregard the cost of schooling. Similarly, the net marginal personal benefit to an individual from additional education is the increment to personal utility if he becomes educated.

The composition and total amount of the costs and benefits from education depend critically on the nature of the labour market for educated persons. The cases of excess demand and excess supply for educated persons will be considered in turn.

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21. The omission of leisure as an argument in the utility function is intended to avoid the unnecessary complication of considering work-leisure choices. Work hours can be assumed to be institutionally fixed without serious distortion.

3. Returns to Education in Full Employment Economies.

Traditional human capital theory has dealt at considerable length with this case, which holds for full employment economies and for occupations requiring either very high-level or very specific training in economies which otherwise have surplus labour. In cases where excess demand prevails, graduates cna easily find a job utilizing their skills and can expect only brief periods of frictional unemployment.

When a person is educated for an excess demand occupation, at a minimum society gains the value of his marginal product on his new job. If his employment helps to relieve a skilled labour bottleneck which had been retarding production, there may be additional output effects resulting from further employment of unskilled labour. There may be shortages of less-educated persons to fill the job he would have had, but a replacement is often available. Society benefits from higher output, additional employment, a greater fraction of its labour force educated, and, under most circumstances, a more equal income distribution.[22] Society incurs the costs enumerated in the previous section. The social rate of return is that discount rate which equates the present values of costs and benefits.

The educated person himself benefits froma higher-level job which generally offers higher pay, more stable employment, and superior working conditions and other non-pecuniary benefits.[23] He may experience gains in utility from higher status or from a richer or more fulfilling life.

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22. Even if a replacement is not available, there will be higher output to the extent that the educated worker's marginal product is higher or his new job than it would have been if he were not educated and worked in some lower-level job. And the output gains from relief of bottlenecks are still realized.

23. I say "generally" because there are cases in which persons may choose to be educated in order to receive additional non-pecuniary benefitsat the expense of lower pay and/or less stable employment. Monetarily speaking, a liberal arts major may earn more selling insurance than he would with a Ph.D. in philosophy. But graduate schools have more applicants than openings. It may also be that employment is less stable for the graduates in some fields. For instance, aerospace engineers in the United States chose an occupation which offered high salaries and the excitement of a new scientific endeavor. Thoughtful observers foretold the instability of the labour market, but many engineers are today regretfully experiencing the consequences of their lack of foresight.

Looking at the private costs, due to the abundance of job opportunities at most educational levels in full employment economies, foregone earnings may be substantial. In additon, out-of-pocket costs may be very large, since students in labour shortage economies often pay a large part of their schooling costs themselves. While the benefits may be considerable, the costs may also be, so that private rates of return, while positive, are often not particularly great.

Private costs and social costs are reasonably close to one another. Furthermore, since there is virtual full employment of graduates with wages reflecting marginal productivity, the economic benefits to society and to the individual are of the same order of magnitude. Thus, one would expect the social and private rates of return to education in full employment economies to be very similar.

The work by Hansen[24] on rates of return to schooling in the United States can be used to illustrate this point. He calculated social and private money rates of return by comparing increments to income streams which can presumably be attributed to education in relation to costs. His estimates of the "internal rates of return to total resource investment in schooling" and "internal rates of return to private resource investment in schooling after tax" for various increments fo education are:

Increment in Schooling	Rate of Return to Total Resource Investment	Rate of Return to Private Resource investment After Tax
Grade 10 over grade 8	9.5%	12.3%
Grade 12 over grade 10	13.7	17.5
Grade 14 over grade 12	5.4	5.1
Grade 16 over grade 14	15.6	16.7

The close similarity between private and total resource rates of return is attributable to the fact that the cost measures are similar in magnitude and the benefit streams identical, which in a labour surplus economy would be impossible. Hansen is very careful to state all the limitations of his analysis and to note that he has "barely begun to consider" any kind of social rate of return. But the cautious conclusion can be drawn that the private and social rates of return to education in the United States are not very different.

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24. W. Lee Hansen, "Total and Private Rates of Return to Investment in Schooling," Journal of Political Economy, 1963, pp. 128-141.

4. Private Returns to Education in Labour Surplus Economies

Private Costs

The private costs of education in labour surplus economies are in many cases quite small. The earnings foregone by an individual depend not only upon the wage rate but also upon the probabilities of employment, underemployment and unemployment. The younger the individual and the lower his educational attainment, the lower the wage and the likelihood of employment. In labour surplus economies, in which there are large numbers of un- and under- employed in search of work, the probability of employment for a school-age person may be very low indeed. Hence, foregone earnings may be a small item to the individual. Under existing institutional arrangements in many underdeveloped countries, either the entire amount or a large fraction of the out-of-pocket costs of education are paid by the central government.[25] The higher the education level, the more likely this is to be the case. Hence the out-of-pocket costs of schooling may be very small or, to the extent that students receive cash allowances, even negative. In sum, the private costs of education in labour surplus economies may amount to very little.

Private Benefits

The private benefits from education in labour surplus economies may be very large. Percentage wage differentials between different skill levels in labour surplus economies are much greater than in full employment economies, particularly in Africa. Furthermore those with the most education and those trained in specific excess demand skills experience much more stable employment than persons with less education. Expected lifetime income for university graduates may be several times as high as for secondary school leavers, who in turn may expect to earn several times as much as primary school leavers. These high private benefits, compared with the low private costs, lead to a very high rate of return for most educational investments.

25 In Kenya, school fees cover around one-fourth of the gross cost of primary education, one-fifth of the costs of secondary education. No fees are charged at post-secondary teachers' colleges or agricultural training institutions. Kenyan university students studying in East Africa in theory are charged £300 per year tuition, but bursaries are so extensive that fees pay only 6% of the costs of the University of Nairobi. See my "The Educational System of Kenya: An Economist's View", University of Nairobi, Institute for Development Studies Discussion Paper No. 103 April, 1971.

Private Demand for Education

The policy of paying the full costs of higher levels of education for virtually everyone who can find spaces in the schools exchanges one imperfection in capital markets for another, resulting in a very high private demand for education. The original imperfection was that capital markets did not operate sufficiently well to allow students from low-income families to borrow long-term funds to pay the short-terms costs of their schooling in cases where the marginal private benefits exceeded the marginal private costs. This capital market imperfection seriously retarded private demand amongst the local population and this situation was judged socially undesirable in view of the goal of equality of educational opportunity for citizens. The full-subsidy scheme, in contrast, not only excludes the very real capital costs from the price of investing in human capital but excludes all out-of-pocket costs as well. Under this scheme the marginal private benefits are much greater than the marginal private costs, so the private rate of return is very high. Without any constraints imposed by the necessity of financing educational investment by recourse to a capital market, this high return is readily translated into a very high private demand which is much greater than it would have been under the original scheme. Enrollments are limited not by a private rate of return which bears any relation to the true social costs and benefits, not by inavailability of capital, but rather by the capacities of the educational institutions. The likely consequences - dissatisfaction and political pressure to expand the educational system beyond a socially optimal size — may be more serious than the original state of affairs. If the government bows to political pressure and decides to educate another person, what will happen to the demand for education? The result depends critically on the motivations for seeking education.

Case 1: Labour Market Stratification[26]

Suppose a person seeks to avoid a low-level job which he perceives as "menial" or "dirty" and therefore desires education to qualify for a high-level job even though he expects to be unemployed at least part of the time. From the point of view of an employer, education may make such a person less desirable for a job. For instance, the morale of a secondary school graduate employed as a sweeper may be so low that a person with less than a primary school education would be more productive. We thus

26 Formal models of this and the next case are to be presented in a forthcoming I.D.S. paper.

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Rigid wages were presumed initially to be the cause of unemployment. If workers at each level are employed until the marginal product of the last worker hired equals the wage rate, employment is determined, which then determines output. If another person is educated, he enters the skilled labour force, thereby reducing the expected probability of finding a job and reducing expected life-time income for skilled workers. Simultaneously, the expected probability of finding an unskilled job is increased, since there is one fewer job-seeker, which raises the expected lifetime income of unskilled workers. The difference between expected lifetime income for skilled and unskilled workers is reduced.

Since demand for education depends positively on the expected lifetime income differential, which is now smaller, there will be less demand for education.

Case 2: "Bumping"

Suppose that persons demand education in order to get the best job they can. In contrast to the previous example, education is demanded in order to stand a better chance of being hired as a sweeper. Many employers prefer to hire persons with more education, either because they are (or are believed to be) more productive or simply because employers prefer to associate with the better-educated. For whatever reason it occurs, preferential hiring by educational level will lead to the general upgrading of hiring standards and of the labour force in general so long as the educational system produces more graduates than are needed to fill skilled positions and some of them are willing to seek employment at lower levels.

Again, since wages are rigid, if productivity effects are neglected, employment and output are determined. There will be ordinarily be fewer educated persons seeking unskilled jobs than the number of unskilled jobs available. If the government now decides to educate another person, due to preferential hiring, the educated person moves to the front of the queue and is hired first, "bumping" a less-educated person from a job. This lowers the expected probability of the remaining unskilled workers finding an unskilled job and also lowers the present value of expected lifetime income for the unskilled. Since there are still the same number of educated workers looking for the same number of high-level jobs in the skilled labour market, the expected lifetime income for persons in the skilled labour market is unchanged. The difference between expected lifetime income for skilled and unskilled workers is increased, resulting in a greater demand for education and even more political pressure.

5. Social Returns to Education in Labour Surplus Economies

Social Costs

In labour surplus economies, the social costs of education may be very much higher than the private costs. Typically, labour surplus economies have a large and perhaps redundant supply of unskilled and uneducated labour, with severe shortages of both physical and human capital. The educational system is a very large user of human and non-human capital. A glance at the capital budgets, wage bills of teachers, and number of teacher training spaces relative to education for other occupations in less developed countries confirms this view.[29] Thus, the resources devoted to education in labour surplus economies are extremely valuable in light of the important alternative uses to which they could be put.

There is an important counter-arguement to the view that the educational system is a large user of capital with valuable alternative uses. With respect to human capital, many teachers are themselves only generally educated secondary school graduates of whom there is a surplus.[30, 31] If these persons were to enter the non-education labour market, they might find that they would fare no better than other secondary school leavers. Perhaps the low salary level of teachers as compared with other white-collar professionals is primarily a reflection of low opportunity productivity. With respect to physical capital, the resources used to construct schools might simply not be supplied otherwise. To the extent that labour is specially volunteered and physical materials are gathered or made, the real resource cost may be quite small.

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28 one can only speculate on the relative magnitudes of the parameters with respect to specific cases, since they differ from one country to another, few unambiguous results are attainable. Therefore, the results just derived in the text are not as unambiguous as they first appear.

29. Out of the approximately 11,000 post-secondary students (excluding those at foreign universities) in Kenya, about two-thirds are enrolled in teacher education courses. Education accounts for 15% of the Kenya Government budget and 10% of its development expenditures. Personal emoluments to teaching and non-teaching staff in schools amounted to £10 million, which is 8% of the Kenya Government budget. See "The Kenyan Educational System: An Economist's View", op.cit.

30 In 1968, Kenya had 10,000 primary school teachers and nearly 1,500 secondary teachers with less than university education and no teacher training. These are out of totals of 38,000 and 4,600 respectively.

(Footnote 31 continued on next page)

Another very large component of the social cost of education is the financial aid granted to students. In many less-developed countries, students in secondary and post-secondary education pay none or only a small fraction of the costs of their education, receive housing and other payments in kind, and in addition may receive a small cash living allowance.[32] The social value of these funds is represented by the social welfare which would be realised if the money were used on the next best projects.

In contrast to full employment economies, the output foregone by having potentially-productive workers in school in labour surplus economies is minimal. By the definition of a labour surplus economy, there are large numbers of unskilled workers relative to the demand. Given this pool of unemployed workers, to the extent that uneducated persons are temporarily withdrawn from the labour force while in school, there are plenty of others to fill the jobs they would have held. There would be a loss of output only to the extent that the persons selected for further education are more productive on the job than those who replace them.

Social Benefits

In labour surplus economies, the social benefits of education may be very small or even negative. If society educates another person, there is some gain in social welfare from that fact alone. If the educated person can use his skills to fill a job which would otherwise be vacant, this is just another version of the labour shortage case described in Section 3 and society gains all the benefits enumerated therein. But suppose instead that society educates a person at a level which only qualifies him for jobs for which other persons are already queueing. To give a concrete example, suppose this person receives a traditional

31 Moorthy and Thore propose an accelerator model for educational expansion, which they then test using Indian data. Their basic conclusion is that as low-level education is expanded, this requires an additional supply of "deep" (i.e. high-level) levels of education. They then qualify their position by noting that "the education acceleration principle may be much more vigorous in a country of full employment than in India which at the moment is characterized by a large unemployed educated labour especially at the non-technical levels." See S. Krishna Moorthy and Sten A.O. Thore, "Accelerator Theory in Education," Indian Economic Review, February, 1959 pp.57-69.

32 See footnote 25.

secondary education, which qualifies him for clerk-level jobs which other secondary completers are also seeking. What are the social benefits to society from having educated him?

Case 1: Labour Market Stratification

If the graduate enters the labour force for clerks, and the wage rate for clerks is fixed at level W_c^* above the market-clearing wage, employment for clerks is unchanged at equilibrium level E*. (See Figure 1). Whether this particular worker is hired or some other secondary completer is hired, society gains no additional output. In fact, to the extent that the education system uses scarce physical and human capital, output is actually reduced. There is a small increase in the fraction employed, since more teachers are now employed. There may be an adverse effect on income distribution to the extent that education is financed by a regressive tax structure. So all in all, there is little if any social benefit from educating another person.

Case 2: Bumping

Suppose instead that this graduate enters the labour force for some less-skilled occupation, say as a gardener; or equivalently his presence in the labour force for clerks induces some other person in that labour force to instead seek a job as a gardener. Then the situation is as in Figures 2 through 4. Unemployment among clerks is the same as it was previously. (Figure 2). Figures 3 and 4 illustrate the labour market for gardeners. The original supplies of educated and uneducated gardeners are represented by S_0 in Figures 3 and 4 respectively. The D_0's are the demand curves, E_0^*'s the initial equilibria, and W_G^* the common rigid wage rates. Since educated gardeners are hired first and demand exceeds supply, all educated gardeners are employed. The presence of an additional supply of educated gardeners (shift of supply curve to S_1 in Figure 3) will increase employment of educated gardeners by the same amount. The greater availability and employment of educated gardeners will lead to the displacement of unskilled gardeners, either immediately by firing or over time by replacement of retirees. If the level of employment of educated gardeners has no effect on the productivity of uneducated gardeners, the demand curve for uneducated gardeners will shift from D_0 to D_1, the leftward shift of the demand curve for uneducated gardeners equaling the rightward shift in the supply of educated gardeners Hence, total employment of gardeners would be unchanged. To the extent

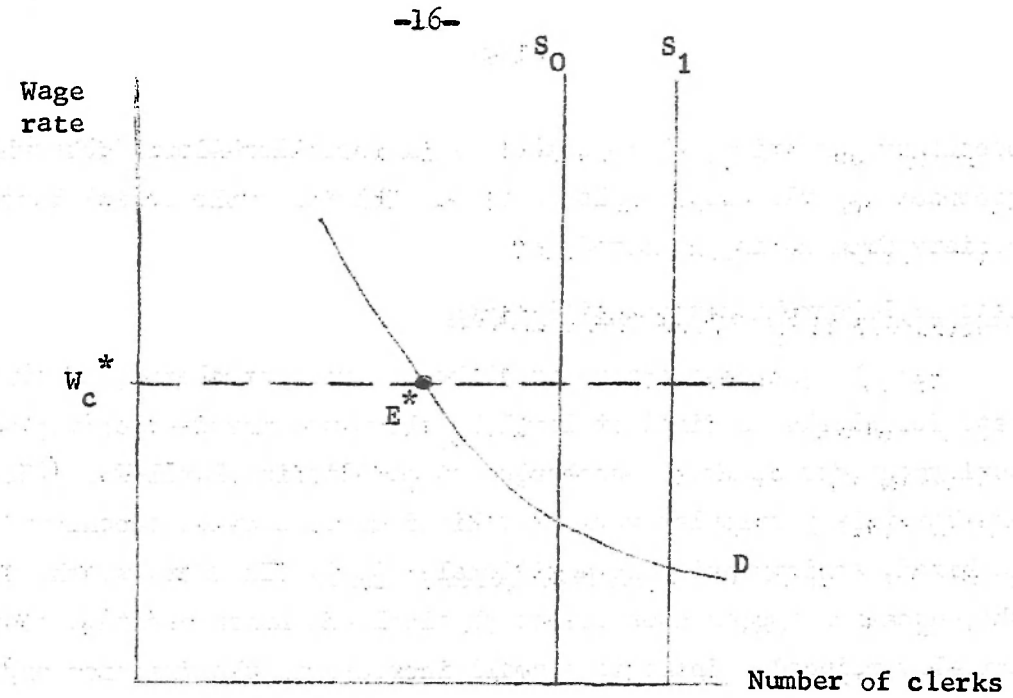

Figure 1. Labour Market for Clerks with More Educated Persons in the Market.

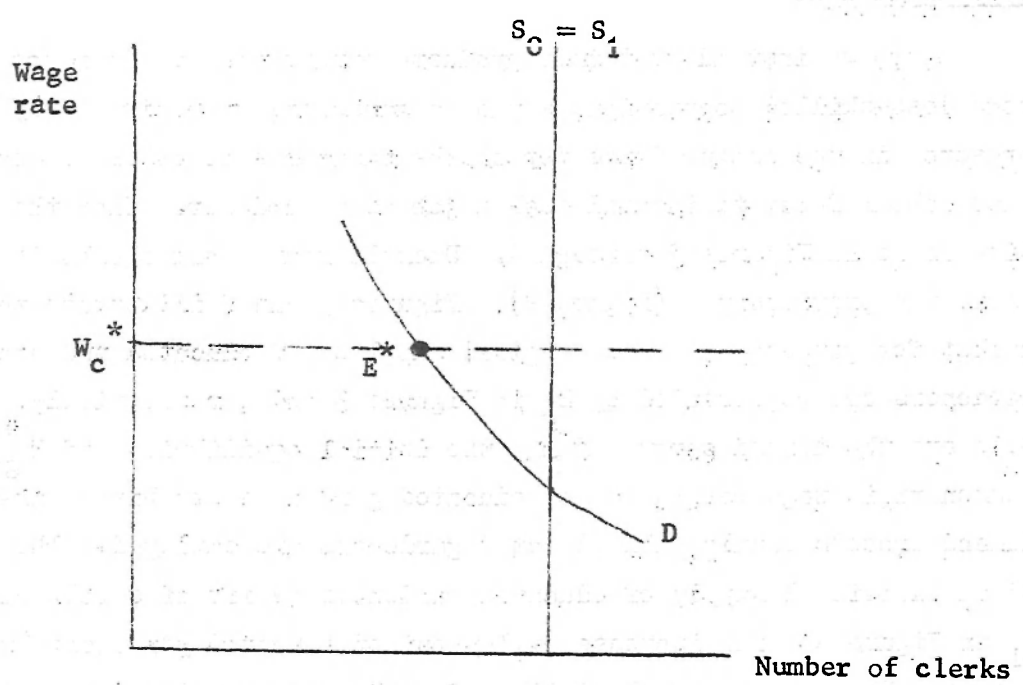

Figure 2. Labour Market for Clerks with Same Number of Educated Persons in the Market.

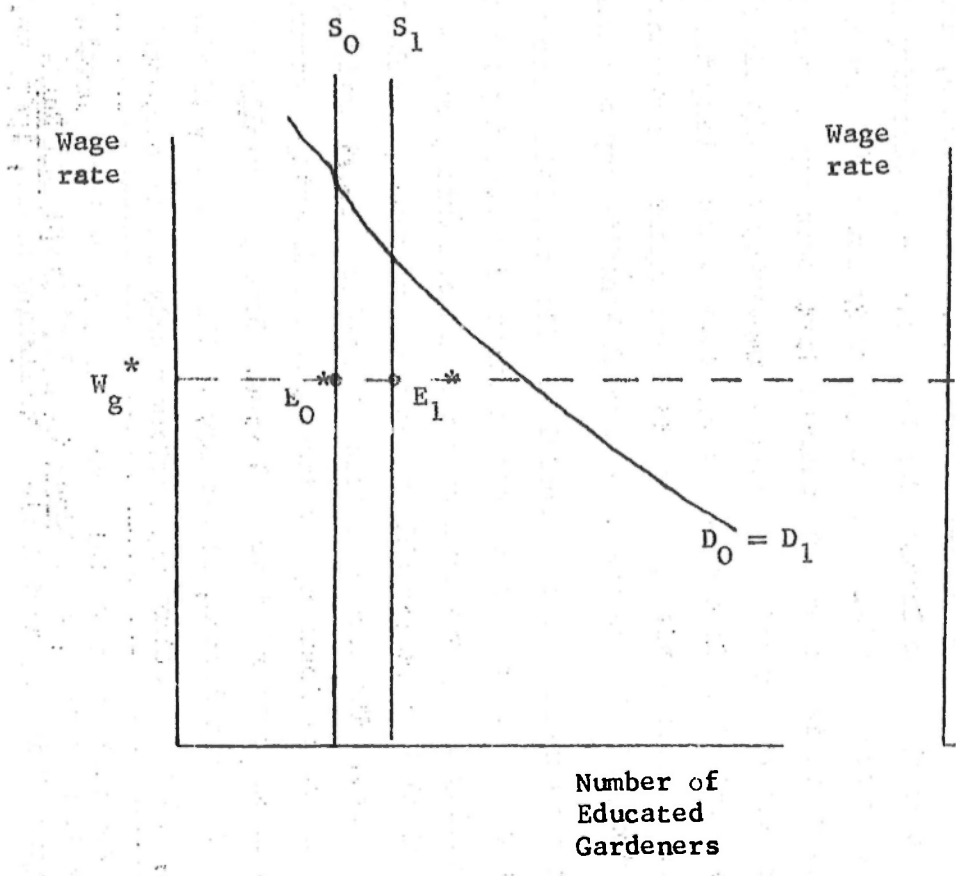

Figure 3. Labour Market for Educated Gardeners.

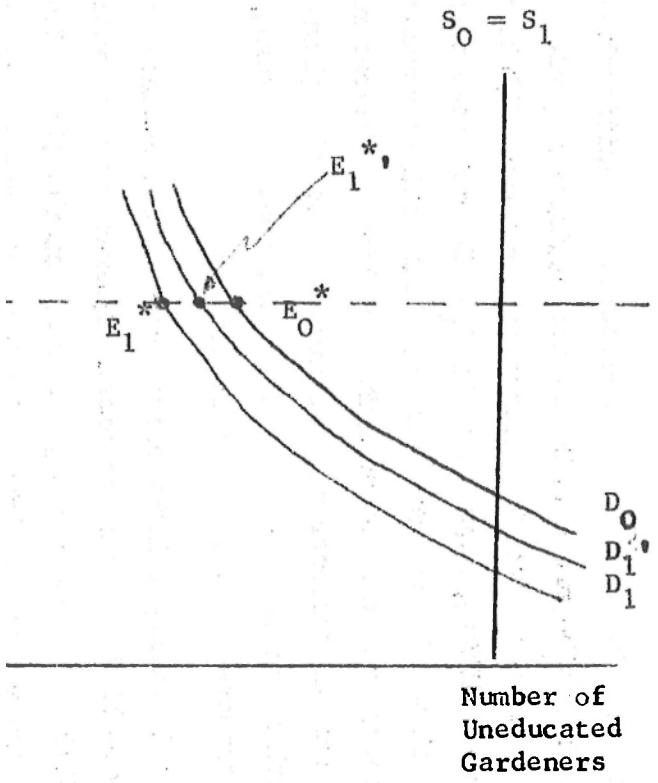

Figure 4. Labour Market for
Uneducated Gardeners.

that educated gardeners are more productive than uneducated ones, output is increased.

If, as would be expected, the presence of additional educated gardeners raises the productivity of the uneducated gardeners, the shift of the demand curve for uneducated gardeners will be to some intermediate position, represented by D_1. In this case there will be an increase in total employment of gardeners with subsequently greater output. The greater the productivity of educated workers relative to uneducated and the stronger the positive effects of employment of educated workers on the productivity of uneducated workers, the greater the output effects of educating more persons.

The productivity gains realised from a better-educated work force may be very small in many industries. Literacy may do little to raise the productivity of domestics, gardeners, and the like. General secondary education may do little for bus drivers, repairmen, and craftsmen. Society gains little additional output by educating its labour force at such levels. However, this is not always the case. For example, there is evidence to suggest that secondary or even primary education raises the output of farmers by improving organisational ability, facilitating optimal choices of crops and inputs, and making the farmer more receptive to innovations, information and expert assistance.[33] To the extent that this is the case, the social benefits may be considerable.

Another possible source of social benefits resulting from a larger educational system relates to the contribution of educated persons to political development. In many less developed countries, only a fraction of primary school leavers are able to continue to secondary school due to space limitations. The method of selection relies almost entirely on the results of an examination, for instance, the Cambridge Primary Examination in the former British colonies. Some potentially outstanding students are late developers, others may be ill on the day of the examination, and still others may perform poorly due to correctable

33 See Jon Moris, "Farmer Training as a Strategy of Rural Development" in James R. Sheffield, ed., Education, Employment and Rural Development, Nairobi, East African Publishing House, 1967, pp.322-365.

educational deficiencies. The larger the educational system, it is argued the greater the chance of educating the best young people to become the future leaders of the country. This argument has long been recognised by economists. Wrote Marshall:

> We may then conclude that the wisdom of expending public and private funds is not to be measured by its direct fruits alone. It will be profitable as a mere investment, to give the masses of the people much greater opportunities and to get the start needed for bringing out their latent abilities. And the economic value of one industrial genius is sufficient to cover the expenses of a whole town.[34]

I believe this argument has some merit, particularly in light of the social goal of equal educational opportunity for all. However, the number of budding young industrial geniuses is probably not very large. It is doubtful that poor countries can afford the large outlays required for the probably small and definitely uncertain benefits.

6. Concluding Remarks

This analysis of the social returns to education suggests that educational programs in labour surplus economies can be divided into three categories in descending order of return:

(1) Education for very high level or specific skill occupations for which a situation of excess demand prevails and is likely to persist.

(2) Education for labour-surplus occupations in which general education yields large productivity effects.

(3) Education for labour-surplus occupations in which there are small or negligible productivity effects.

If the social rate of return is accepted as a proper criterion for public resource allocation, the implication of this analysis is that society should limit the growth of the third category of education and invest most heavily in the first and second types until marginal social costs and marginal social benefits are equal. More specifically, it is likely that in less-developed countries, this means holding back on general primary and secondary education and rapidly expanding vocational and technical, agricultural, and university education. Whether such a course is politically feasible is the task of the political scie
to determine.

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34 Alfred Marshall, Principles of Economics, 8th

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